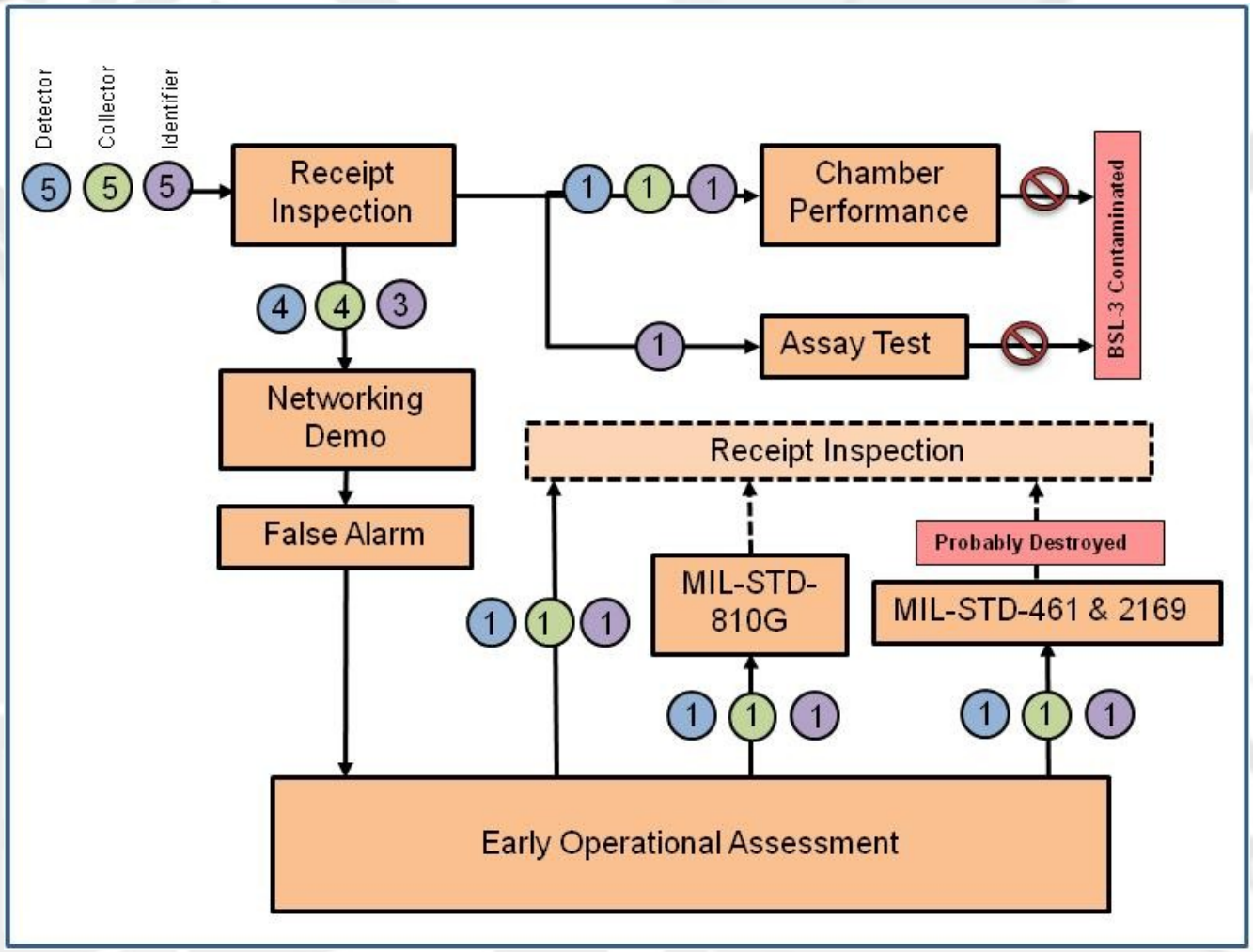
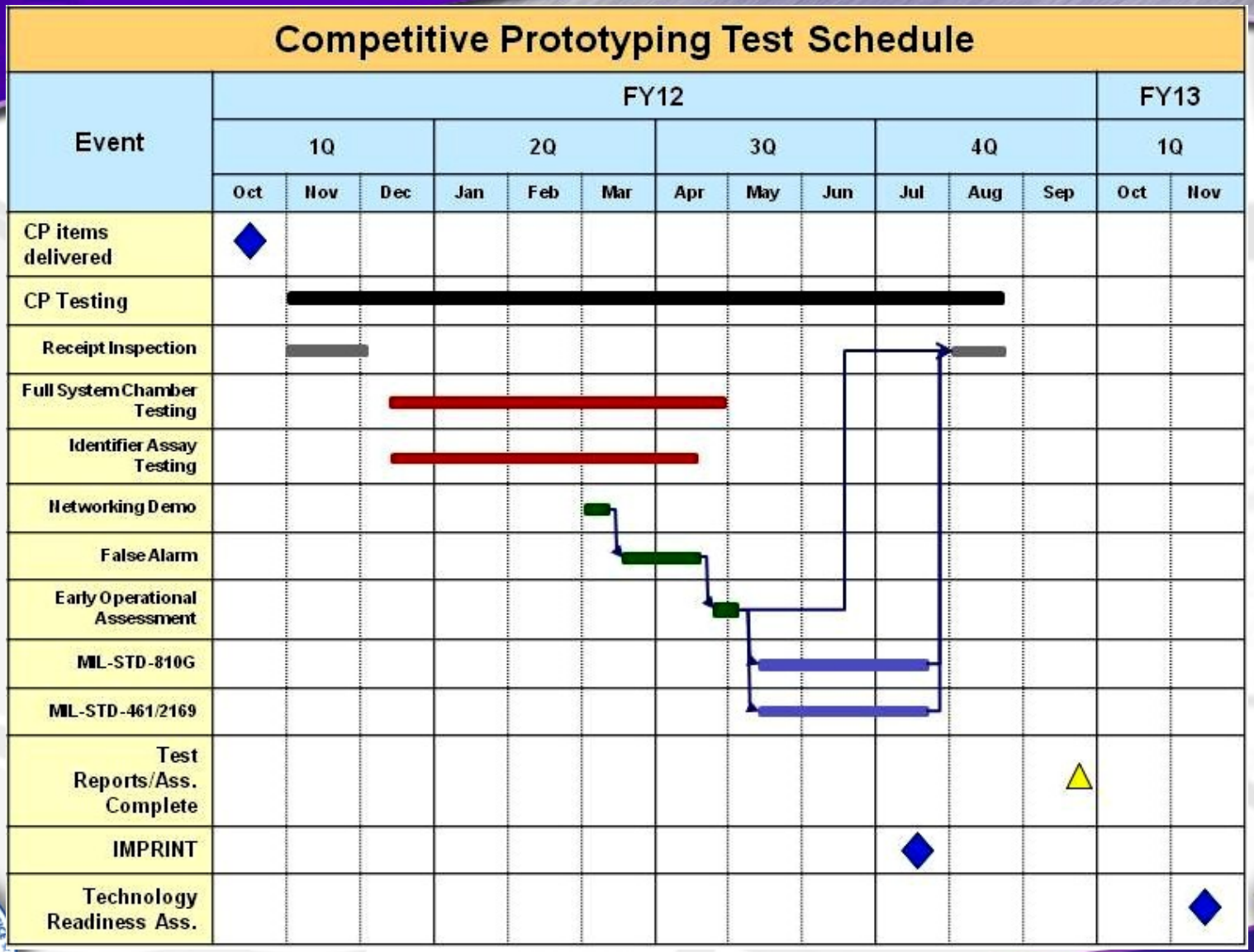
JBTDS
Planned Competitive Prototyping (CP)
Test Events

31 March 2011

Work Flow


Detector
Collector
Identifier
5
5
5
Receipt Inspection
1
1
1
Chamber Performance
BSL-3 Contaminated
4
4
3
1
Assay Test
Networking Demo
Receipt Inspection
False Alarm
Probably Destroyed
1
1
1
MIL-STD-810G
MIL-STD-461 & 2169
1
1
1
1
1
1
Early Operational Assessment

Test Schedule



Receipt Inspection

Test Site: John Hopkins University / Applied Physics Lab (JHU/APL)

- **Physical characteristics**
  - Size (LWH) of each sub-system alone, in shipping container, in soft case/carry configuration.
  - Weight of each sub-system alone, in shipping container with supplies, in soft/carry case with supplies.
  - Intake Air Flow Rates (detection and collection).
  - Measurements include necessary support equipment and consumables.

- **Rough Order Limit of Detection (LOD)**
  - 3 detectors per vendor.
  - Challenged with a “Stepped-up” aerosol of *Bacillus athrophaeus* (BG).
  - Co-disseminated with a Low Level “natural background” for detector algorithms.

- **Collector Performance**
  - 3 collectors per vendor.
  - Collection Efficiency (CE) and Collection Concentration Factor (CF).
  - 4 particle size ranges (1, 3, 5, and 9 micron).

- **Limited Identifier Performance**
  - 3 identifiers per vendor.
  - 3 standard solutions of BG serial diluted based on vendor Limit of Identification claims.

- **Duration:** November 2011 (4-5 Weeks)

Live Agent Chamber Performance

Test Site: Dugway Proving Ground (DPG), Life Sciences Test Facility

- **Systems Per Vendor:** 1 Detector, 1 Collector, and 1 Identifier.

- **Test Summary:**
  - 1 agent from each biological class (spore, vegetative cell, toxin, and virus).
  - Simulated Natural Background disseminated with all aerosol challenges.
  - DyCAG System.
  - ➢Agent Only Limit of Detection.
  - ➢Agent and Interferent (TBD) Limit of Detection.
  - ➢Interferent Only (False Alarm / False Identification Testing).
  - ➢Aerosolized Limit of Identification. [Samples collected during previous tests will be serial diluted to determine the Limit of Identification of aerosolized samples with and without Interferent. Answer the question: Is the identifier more sensitive than the detector?]

- **Duration:** December – April 2012 (4 ½ Months)

Class	BSL-3 (live)	Starting Concentration Range (ACPLA)
Spore	*Bacillus anthracis* Ames	50
Vegetative Cell	*Francisella tularensis* (Schu 4)	50
Virus	*Venezuelan equine encephalitis* (VEE)	100
Toxin	*C. Botulinum* toxin	50

Live Agent Assay

Test Site: Edgewood Chem. Biological Center (ECBC), McNamara Life Sciences Bldg.

- **Systems Per Vendor:** 1 Identifier.

- **Test Summary:**
  - 1 agent from each biological class (spore, vegetative cell, toxin, and virus).
  - Solutions prepared in media specific to each identifier.
    - Agent Only Limit of Identification.
    - Agent and Interferent Limit of Identification.
    - Identification Selectivity (near-neighbors).
    - DoD Biological Sampling Kit (BSK) buffer solution compatibility

- **Proposed Agents:** Same as Aerosol Chamber Tests

- **Proposed Near-neighbors:** 2 from each class.

- **Interferents:** TBD

- **Duration:** December – April 2012 (4 ½ Months)

Networking Demonstration

Test Site: ECBC (JBTDS Personnel)

- **Systems Per Vendor:** 4 Detectors, 4 Collectors, and 3 Identifiers.
- **Subtest 1 Alert Management**
  - Systems will be set-up in an array configuration. Then, operators will induce faults in the remote nodes by manually disabling the network connections and power supply to check for proper relay of alerts to the communications node.
- **Subtest 2 Collection Management**
  - Test personnel will use the communications node to remotely initiate collection and then later collect the samples to verify successful collection.
- **Subtest 3 Alarm Management**
  - Test personnel will walk to each detection node in turn to stimulate it with a contractor-provided "stimulator". The "stimulator" will initiate an alarm while personnel at the C2 center assess adequate alarm transmission to the communications node.
- **Data Collection**
  - JBTDS personnel will collect data such as but not limited to: Proper relay of system alerts from the detector/collector nodes to the communications node; Proper relay of information from the communications node to the detector/collector nodes such as remotely initiated collection; and Proper relay of system alarms from the detector/collector nodes to the communications node.
- **Duration:** March 2012 (1 Week)

False Alarm Rate

Test Site: JBTDS Personnel / ECBC Environmental Field Test Branch (EFTB), M-Field Test Range

- **Systems Per Vendor:** 4 Detectors, 4 Collectors, and 3 Identifiers.
- **Test Procedure:**
  - Detectors and Collectors will be set-up in an array configuration.
  - Systems will be powered by local 110VAC.
  - Systems will run 24 hours per day for 3 weeks (500 hours).
  - Testers will periodically collect samples and analyze them with the identifier.
  - Testers will periodically restart all system nodes (force them to run through their Built In Test (BIT)).
    - Shut downs and start ups during personnel shift changes (every 8 or 12 hours).
- **Duration:** March – April 2012 (4 Weeks)

Early Operational Assessment

Test Site: ECBC (JBTDS Personnel)

- **Systems per vendor:** 4 detectors, 4 collectors, and 3 identifiers.
  - **Vendor Training:**
    - Representative Warfighters from local units to Aberdeen Proving Ground (APG) will be trained in the operation (to include operator maintenance) of the systems.
  - **Evaluations**:
    - Operation and Maintenance evaluations will be conducted on the Warfighters.
  - **Data Collection:**
    - JBTDS personnel, as well as, Army Research Laboratory (ARL) Human Factors Engineers will collect operational data such as but not limited to: Time to set-up, Time to tear down, Time to replenish consumables, Time to perform operator maintenance, and Time to train.
  - **User Survey:**
    - Consist of questions regarding the ease of use and ease of repair of the system.
    - Test subjects will also be interviewed by ARL personnel to provide data for completing the Improved Performance Research Integration Tool (IMPRINT) Model.
  - **Duration:** Late April – Early May 2012 (1 Week)

Environmental MIL-STD-810G (SELECTED)

Test Site: US Army Aberdeen Test Center (ATC)

- **Systems Per Vendor:** 1 Detector, 1 Collector, and 1 Identifier.
- **Test Procedure:**
  - Tests will be conducted sequentially with the least destructive tests first.
  - BEFORE and AFTER each test, detectors will be "triggered", collectors will collect a sample, and identifiers will process a training assay.
  - Identifiers will not be subjected to all environmental tests due to anticipated mission profile
- **Duration:** May – July 2012 (8 Weeks)
- **Proposed Tests:**

✓ High Temperature (Operational)	✓ Blowing Rain
✓ Low Temperature (Operational)	✓ Blowing Sand
✓ High Altitude	✓ Blowing Dust
✓ Salt Fog	✓ Freezing Rain
✓ Solar Radiation	✓ Transportation Drop (48")
✓ Humidity	✓ Vibration (Unsecured Cargo)

EMI / NSL / HAEMP MIL-STD-461/2169 (SELECTED)

Test Site: US Army Test Center (ATC), Naval Air Warfare Center Aircraft Division

- **Systems Per Vendor:** 1 Detector, 1 Collector, and 1 Identifier.

- **Test Procedure:**
  - Tests will be conducted sequentially with the least destructive tests first.
  - DURING EMI tests, detectors will alarm to stimulator material, collectors will collect a sample, and identifiers will process a training assay.
  - AFTER the NSL and HAEMP tests, detectors will alarm to stimulator material, collectors will collect a sample, and identifiers will process a training assay.

- **Duration:** May – July 2012 (8 Weeks)

EMI	CE 102	Conducted Emissions, Power Leads, 10 kHz to 10 MHz
	CS 101	Conducted Susceptibility, Power Leads, 120 Hz to 150 kHz
	CS 114	Conducted Susceptibility, Bulk Cable Injection, 10 kHz to 200 MHz
	CS 115	Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation
	CS 116	Conducted Susceptibility, Damped Sinusoidal Transients, Cables and Power Leads, 10 kHz to 100 MHz
	RE 102	Radiated Emissions, Electric Field, 2 MHz to 18 GHz
NSL		Electric field rate of change @ 10 meters (6.8×10[11] V/m/s)